A conjecture on primes involving the pairs of sexy primes

Marius Coman
Bucuresti, Romania
email: mariuscoman13@gmail.com

Abstract. This paper states a conjecture on primes involving two types of pairs of primes: the pairs of sexy primes, which are the two primes that differ from each other by six and the pairs of primes of the form [p, q], where q = p + 6*r, where r is positive integer.

Conjecture:

If n and n + 6 are both primes (in other words if [n, n + 6] is a pair of sexy primes), where n ≥ 7, then the number m = n + 3 can be written at least in one way as m = p + q, where p and q are primes, q = p + 6*r and r is positive integer.

Verifying the conjecture:

(for the first fifteen pairs of sexy primes)

: for [n, n + 6] = [7, 13] we have [p, q, r] = [5, 5, 0];
: for [n, n + 6] = [11, 17] we have [p, q, r] = [7, 7, 0];
: for [n, n + 6] = [13, 19] we have [p, q, r] = [5, 11, 1];
: for [n, n + 6] = [17, 23] we have [p, q, r] = [7, 13, 1];
: for [n, n + 6] = [23, 29] we have [p, q, r] = [13, 13, 0];
: for [n, n + 6] = [31, 37] we have [p, q, r] = [5, 29, 1] or [17, 17, 0];
: for [n, n + 6] = [37, 43] we have [p, q, r] = [11, 29, 3] or [17, 23, 1];
: for [n, n + 6] = [41, 47] we have [p, q, r] = [7, 37, 1] or [13, 31, 3];
: for [n, n + 6] = [47, 53] we have [p, q, r] = [7, 37, 1] or [13, 37, 4] or [19, 31, 2];
: for [n, n + 6] = [53, 59] we have [p, q, r] = [13, 43, 5] or [19, 37, 3];
: for [n, n + 6] = [61, 67] we have [p, q, r] = [17, 47, 5] or [23, 41, 3];
: for [n, n + 6] = [67, 73] we have [p, q, r] = [11, 59, 8] or [17, 53, 6] or [23, 47, 4] or [29, 41, 2];
: for [n, n + 6] = [73, 79] we have [p, q, r] = [17, 59, 7] or [23, 53, 5] or [29, 47, 3];
: for [n, n + 6] = [83, 89] we have [p, q, r] = [7, 79, 12] or [13, 73, 10] or [19, 67, 8] or [43, 43, 0];
: for [n, n + 6] = [97, 103] we have [p, q, r] = [11, 89, 13]; or [17, 83, 11] or [29, 71, 7] or [47, 53, 1].